US Army Corps of Engineers®
Engineer Research and Development Center

National Erosion Control Development and Demonstration Program (Section 227)

Jefferson County, Texas

Background

The Jefferson County, Texas, project location fronts the McFaddin National Wildlife Refuge near High Island, 49 km (30.4 miles) west of the Texas/Louisiana border. Beaches at the demonstration area consist of a thin sand veneer over mud. Wave heights average between 0.76 m (2.5 ft) and 1.4 m (4.6 ft), with much higher waves occurring during storms. Mean tide range is 0.39 m (1.28 ft). The annual average long-term shoreline erosion rate is approximately 3 m (10 ft). Since 1980, most of the roadway spanning the coast between High Island and Sabine Pass has been closed due to coastal erosion.

Problem

Storms erode the thin layer of sand, exposing the mud to further erosion. During storms, beach sediment that is not pulled offshore may be washed over the low-lying dune and deposited in a wetland area landward of the beach. Overwashed sediment is not recovered from the wetland and returned to the beach profile, which has limited post-storm recovery due to a deficit of sediment in the littoral system.

Geotube is constructed along beach

Technology

The primary objectives of the project will be to minimize erosion of the exposed cohesive sediment and to minimize sand overwash. These objectives will be accomplished by constructing experimental low-volume beach nourishment templates contained by geotextile tube groin cells and dune construction. The 762-m-(2,500-ft-) long dune is designed to withstand a 5-year return period storm. Fronting half of the engineered dune corridor is beach nourishment divided into four experimental cells of varying fill volume and grain size. The objective of the nourishment is to investigate the longevity of minimal fill volumes (15 to 30 m^3/m or 6 to 12 yd^3/ft) combined with native beach sand (0.17 mm < d_{50} < 0.21 mm) or sand larger than what is naturally present on the active beach profile (0.31 mm < d_{50} < 0.40 mm). A geotextile tube groin separates each experimental cell. The function of the tube is to only contain the experimental areas.

Status

The Final Environmental Assessment was approved and the Findings-of-No-Significant-Impact (FONSI) was signed in the fall of 2003. The Memorandum of Agreement with the Texas General Land Office was also signed and construction was completed in August 2004. A 36-month project-monitoring program was established with the first monitoring surveys completed in August 2004. The monitoring program includes cross-shore beach profiles, aerial photography, sediment samples, water-level measurements, structure

inspection, and data management and analysis. An improved overwash algorithm, applicable to low barriers such as at Jefferson County, has been developed and implemented in SBEACH for project evaluation.

Time Line

Monitoring: August 2004-August 2007

Program Manager

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Available Documentation

Waters, J.P. (2004). "Section 227 demonstration project: Jefferson County, TX," *Proceedings*, *Coastal Structures 2003*, American Society of Civil Engineers.

Program Authorization

Water Resources and Development Act of 1996 (Public Law 104-303, 110 Stat. 3658) dated October 12, 1996.

Additional information can be found at *http://chl.erdc.usace.army.mil/section227*.